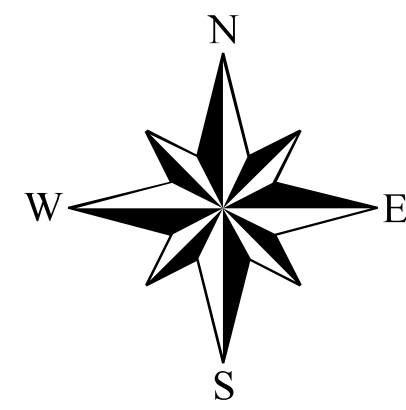


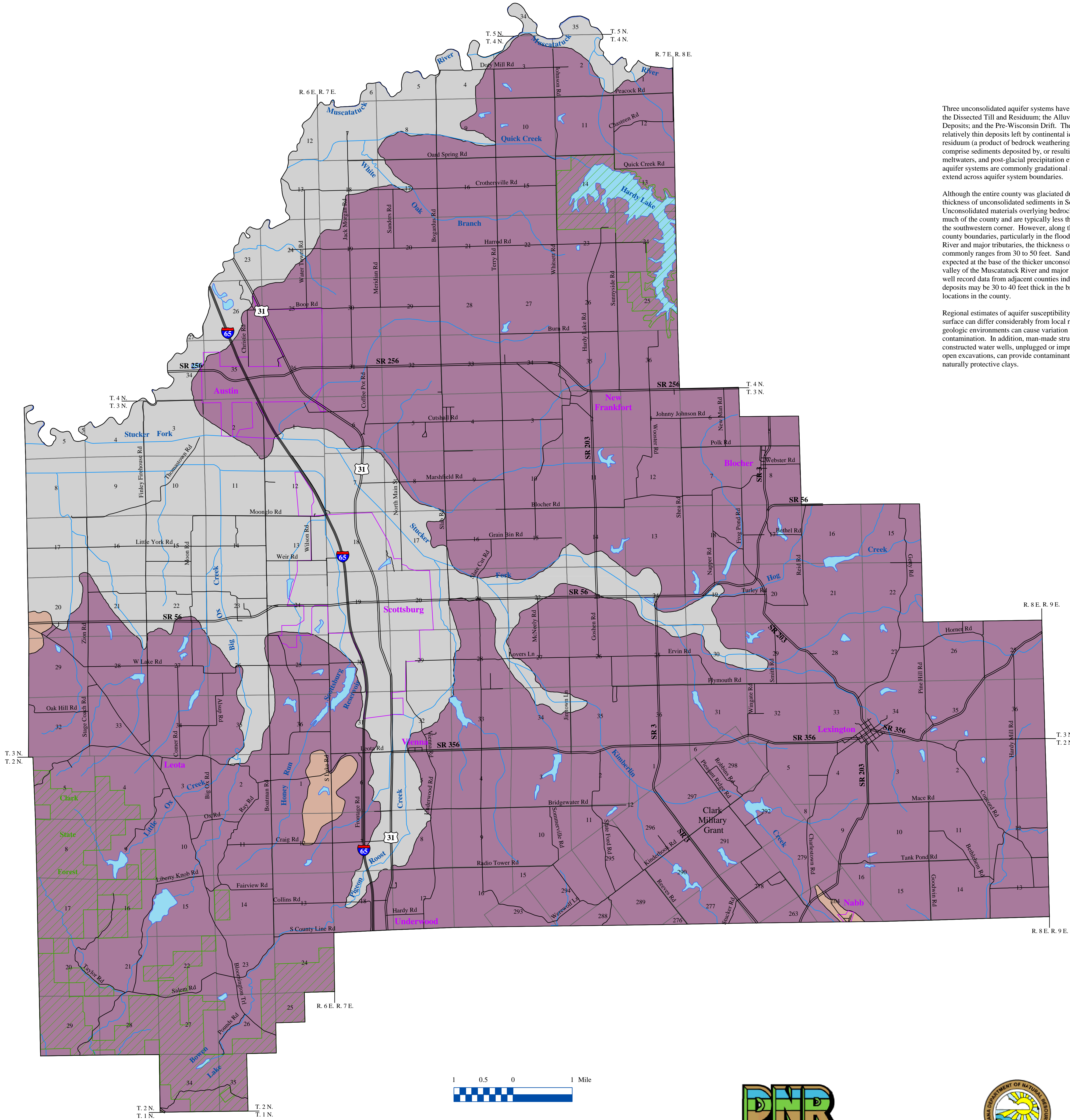
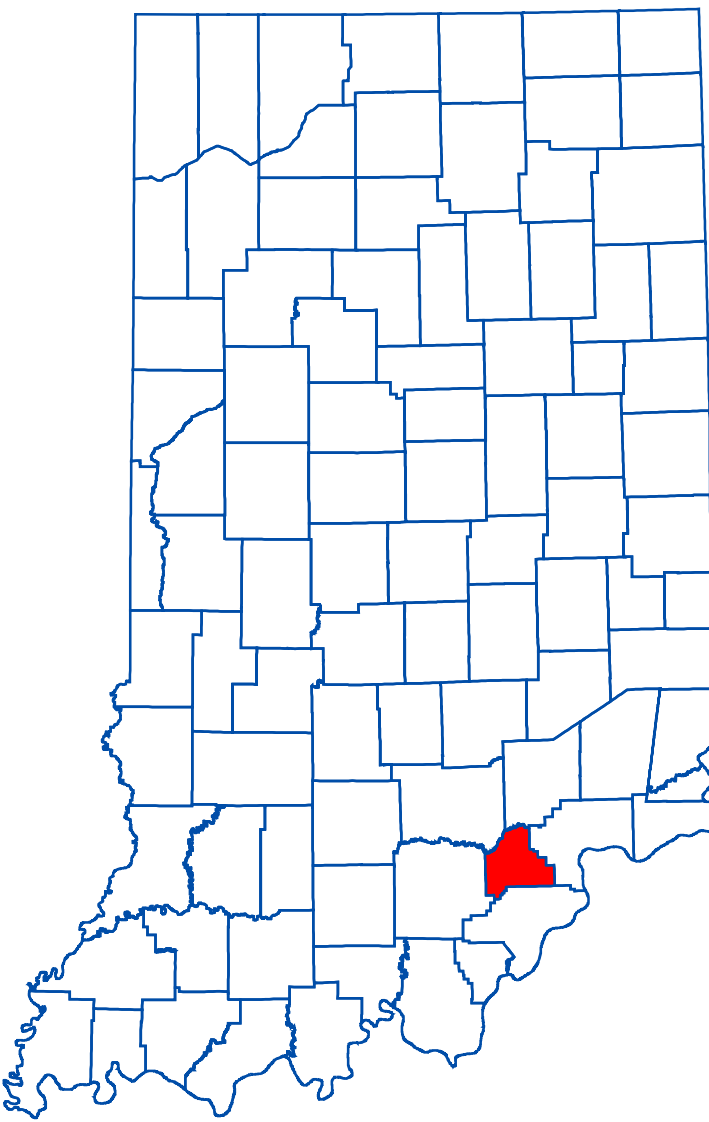
UNCONSOLIDATED AQUIFER SYSTEMS OF SCOTT COUNTY, INDIANA

EXPLANATION

- County Road
- State Road & US Highway
- Interstate
- Stream
- Lake & River
- Municipal Boundary
- State Managed Property



Location Map



Three unconsolidated aquifer systems have been mapped in Scott County: the Dissected Till and Residuum; the Alluvial, Lacustrine, and Backwater Deposits; and the Pre-Wisconsin Drift. The first system includes relatively thin deposits left by continental ice sheets as well as eroded residuum (a product of bedrock weathering). The next two systems comprise sediments deposited by, or resulting from, glacial meltwaters, and post-glacial precipitation events. Boundaries of these aquifer systems are commonly gradational and individual aquifers may extend across aquifer system boundaries.

Although the entire county was glaciated during pre-Wisconsin times, the thickness of unconsolidated sediments in Scott County is quite variable. Unconsolidated materials overlying bedrock are less than 25 feet thick in much of the county and are typically less than 10 feet thick on the hills in the southwestern corner. However, along the northern and northwestern county boundaries, particularly in the floodplains of the Muscatatuck River and major tributaries, the thickness of unconsolidated deposits commonly ranges from 30 to 50 feet. Sand and gravel aquifers are expected at the base of the thicker unconsolidated materials in the main valley of the Muscatatuck River and major tributaries. Seismic and water well record data from adjacent counties indicate that unconsolidated deposits may be 30 to 40 feet thick in the broad flat uplands in several locations in the county.

Regional estimates of aquifer susceptibility to contamination from the surface can differ considerably from local reality. Variations within geologic environments can cause variation in susceptibility to surface contamination. In addition, man-made structures such as poorly constructed water wells, unplugged or improperly abandoned wells, and open excavations, can provide contaminant pathways that bypass the naturally protective clays.

Dissected Till and Residuum Aquifer System

The Dissected Till and Residuum Aquifer System, which is mapped in about 78 percent of Scott County, has the most limited ground-water resources of the unconsolidated aquifer systems in the county. Unconsolidated materials of this aquifer system predominantly consist of thin, eroded bedrock residuum and pre-Wisconsin tills and thin outwash terraces. Also included in many of the stream bottoms of this aquifer system are relatively thin deposits of alluvium, colluvium, and lacustrine materials.

Total thickness of this system in Scott County typically ranges from about 10 to 40 feet. The thickest deposits, based on seismic data, are over 50 feet thick on the upland ridges north of Quick Creek. However, in most other locations the unconsolidated materials covering the bedrock are so thin the aquifer elevations are approximately equal to the bedrock surface. The bedrock surface varies in elevation from about 500 feet above mean sea level (m.s.l.) south of Austin near Stucker Fork to over 1020 feet m.s.l. in the hills around Bowen Lake southwest of Underwood.

There is little potential for water production in the Dissected Till and Residuum Aquifer System in Scott County and several dry holes have been reported. Because the aquifer system is typically very thin, all reported wells penetrating this aquifer system in the county are developed in the underlying bedrock. However, in places large-diameter bored (bucket-rig) wells may produce water from thin sands within the predominantly clay and silt materials of this aquifer system. Because of the generally low permeability of the near-surface materials, this system is not very susceptible to contamination from surface sources.

Alluvial, Lacustrine, and Backwater Deposits Aquifer System

In Scott County the Alluvial, Lacustrine, and Backwater Deposits Aquifer System consists of unconsolidated deposits in the valleys of the Muscatatuck River and its larger tributaries, including Stucker Fork. The unconsolidated deposits in this aquifer system come from two sources. The primary source is glaciolacustrine deposits that were formed in bodies of relatively stagnant lake water and are marked by soft silt and clay. A secondary source is alluvium, and perhaps some old outwash, deposited by the streams along with colluvium eroded from the valley walls and upland areas. The lake deposits were formed when the valley of the East Fork White River was choked with coarser material carried by glacial meltwater. Thick deposits of this material effectively dammed tributary streams, creating lakes. Thick deposits of silt, sometimes called "slackwater clay," mark the former locations of these glacial lakes. These lacustrine deposits are noted on Quaternary geology maps and soil maps.

The total thickness of unconsolidated deposits (mostly clay and silt) in this aquifer system varies considerably, from about 25 feet to more than 60 feet. The thickest deposits exist in the floodplain south of Stucker Fork, where sequences of glacial outwash and lacustrine deposits have been stacked above a deep part of a buried bedrock valley. The thickness of permeable sand or gravel zones (where present) is typically between 5 and 10 feet, but may exceed 15 feet in a few isolated places. Most of the permeable zones are composed of fine-grained sand. The overall scarcity of productive zones of sand and gravel in this aquifer system is apparent from the number of water wells completed in the underlying bedrock aquifers. Although very few water well records are available, it is expected that many wells drilled in this system (especially bucket-rig wells) may yield sufficient water for domestic needs.

This aquifer system is marked by thick deposits of soft silt and clay that have low susceptibility to surface contamination.

Pre-Wisconsin Drift Aquifer System

The Pre-Wisconsin Drift Aquifer System is mapped in a few small areas. These areas are located south and west of Scottsburg and near the town of Nabb in southeastern Scott County. Due to extremely limited water well data, mapping is primarily based on geology, topography, soil types, field observations, and water well data from adjacent counties. Because of the scarcity of water well data for this aquifer system in the county, boundaries with other aquifer systems cannot be defined with a high degree of confidence.

The unconsolidated deposits in this system predominantly consist of pre-Wisconsin glacial materials that range in thickness from about 25 to more than 45 feet. In places, this system is also covered by younger lacustrine deposits of Wisconsin age. The area mapped around Nabb is based on field observations of stream flow, soil types, and the area's geologic and topographic characteristics, which are similar to an area supporting a public water supply well field in Clark County (Washington Township Water Corporation) about 3 miles to the southeast.

In Scott County, this aquifer system is expected to be a better resource than the Dissected Till and Residuum Aquifer System. Potential aquifer materials within the glacial till include discontinuous intratill sand and gravel units. The Division of Water has a record for only one water well completed in this system and the well driller described a seam of gravel 5 feet thick. Well yields would be expected to be quite variable. Because sand and gravel zones are not expected to be very thick in much of the aquifer system, large diameter bored wells may be needed in places to increase the yield to an acceptable amount for domestic purposes.

The Pre-Wisconsin Drift Aquifer System has a low susceptibility to surface contamination because intratill sand and gravel units are generally separated from the surface by till layers.

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This map was created from several existing shapefiles. Township and Range Lines of Indiana (line shapefile, 20020621), Land Survey Lines of Indiana (polygon shapefile, 20020621), and County Boundaries of Indiana (polygon shapefile, 20020621), were all from the Indiana Geological Survey and based on a 1:24,000 scale. Draft road shapefiles, System1 and System2 (line shapefiles, 2003), were from the Indiana Department of Transportation and based on a 1:24,000 scale. Populated Areas in Indiana 2000 (polygon shapefile, 20021000) was from the U.S. Census Bureau and based on a 1:100,000 scale. Streams27 (line shapefile, 20000420) was from the Center for Advanced Applications in GIS at Purdue University. Managed Areas 96 (polygon shapefile, various dates) was from IDNR. Unconsolidated aquifer systems coverage (Grove, 2004) was based on a 1:24,000 scale.

Unconsolidated Aquifer Systems of Scott County, Indiana

by
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